

## Amphibians

### Coeur d' Alene Salamander (*Plethodon idahoensis*)

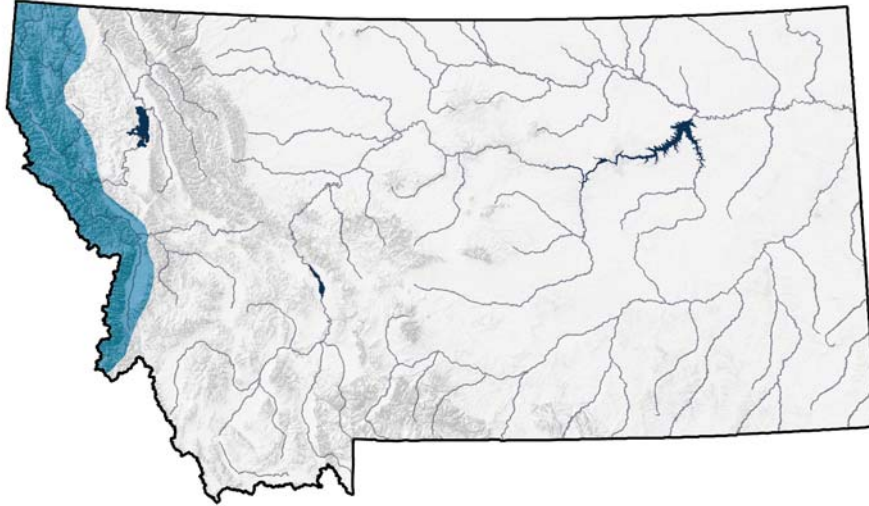


Figure 61. Distribution of the Coeur d' Alene Salamander

#### Range

The Coeur d' Alene salamander is a regional endemic for which Montana is the eastern limit in distribution. In Montana, the Coeur d' Alene salamander is known from about 45 locations in five northwestern counties: Lincoln, Sanders, Mineral, Missoula, and Ravalli. The southern limit of known distribution is Lake Como Falls in the Bitterroot River drainage (Maxell 2002), and the northernmost population is along the South Fork of the Yaak River (Wilson and Simon 1987; Maxell et al. 2003). Maximum known elevation is 5,200 feet (1,585 meters).

The Coeur d' Alene salamander has been the subject of taxonomic controversy nearly since its initial discovery. First classified as a new species (Slater and Slipp 1940), it was later reclassified (Lowe 1950) as a subspecies of the Van Dyke salamander (*Plethodon vandykei idahoensis*) found in western Washington. Whether considered a species or a subspecies, the Coeur d' Alene salamander represents a unique genetic resource in Idaho, Montana, and British Columbia and should be managed as such (Howard 1993). The Coeur d' Alene salamander has a small range in northern Idaho, western Montana, and southeastern British Columbia. It is found in close association with water in springs or seeps, spray zones of waterfalls, and edges of streams and feeds on aquatic and terrestrial insects. Coeur d' Alene salamanders tend to have small home ranges, are strongly philopatric, and show no tendency to disperse away from home ranges when disturbed (Petranka et al. 1993).

The Coeur d' Alene salamander is rare and local, distributed in suitable habitat (Werner and Reichel 1994), and in Montana is reported in Lincoln, Sanders, Mineral, Missoula, and Ravalli counties. The core of distribution and area of greatest density of known locations is in the northern Idaho drainages of the St. Joe, North Fork Clearwater, and Coeur d' Alene rivers in Idaho (Groves 1989), but the distribution of the species does extend northward along the Moyie River drainage into British Columbia, Canada (Wilson et al. 1989).

## **Habitat**

The habitat for Coeur d' Alene salamanders includes the three major habitat categories: springs and seeps, waterfall spray zones, and stream edges (Wilson and Larsen 1988; Werner and Reichel 1994; Boundy 2001; Maxell 2002). Specific primary habitats are seeps and streamside talus, but they also inhabit talus far from free water (deep talus mixed with moist soil on well-shaded north-facing slopes). Coeur d' Alene salamander occurrences are generally located in coniferous forests, but are not restricted to a particular overstory species or aspect. In wet weather, they also occur in leaf litter and under bark and logs in coniferous forests.

All plethodontid salamanders respire through their skin; terrestrial species lose water to the environment through evaporation and are therefore restricted to cool, damp environments. Coeur d' Alene salamanders are closely tied to water and are considered among the most aquatic plethodontids (Brodie and Storm 1970). Because they may live in the harshest climate of any northwestern plethodontid (Nussbaum et al. 1983), they are highly dependent on the thermal and hydrologic stability provided by wet habitats in otherwise inhospitable surroundings.

Sites occupied by Coeur d' Alene salamanders in Montana have fractured rock formations present, and nearby habitats are typically forested (Reichel and Flath 1995). Foraging areas include seepage areas and splash zones with high humidity, high substrate moisture, and relatively high temperatures (Wilson and Larsen 1988). Shelter is provided by deep bedrock fractures or in talus habitat (Wilson and Larsen 1988). Montana populations are found primarily in talus areas along splash zones of creeks, or with seeps running through (Teberg 1963, 1965; Wilson and Larsen 1988). Idaho and Montana populations breed in both spring and fall, although most eggs usually are laid in the spring. Eggs are laid in moist, concealed places on land (Stebbins 1985) far down in the rocks (Werner and Reichel 1994).

## **Management**

Potential threats for the species across its global range also apply to Montana populations, but population declines or extinctions have not yet been documented here. Some populations continue to be vulnerable to highway

construction activity, and most populations occur at elevations and in forest types where timber harvest is a common activity. Routine monitoring (Groves et al. 1996) of known populations should be conducted to identify threats to each, as well as to determine their continued viability.

### **Conservation Concerns & Strategies**

Conservation Concerns	Conservation Strategies
Disturbances, such as timber harvest, fire, road and trail construction, and water diversion projects	Fence known salamander sites to exclude livestock
Pollution	Regulate chemical application (herbicides, pesticides, fertilizers, etc.) within 300 feet of water bodies or wetlands
Introduction of exotic species	Avoid road construction within 300 feet of known salamander sites and avoid stocking non-native fish in nearby waters
Restricted mobility coupled with increasing habitat fragmentation make the Coeur d' Alene salamander susceptible to local extirpation	Habitat protection and conservation through regulation of development, logging, and chemical applications
	Surveys of potential habitats for the Coeur d' Alene salamander
Disease and parasites	To prevent spread of chytrid fungus, personnel working in either lentic or lotic systems should thoroughly rinse and decontaminate all equipment as described in Maxell et al. (2004)
Global climate change	Conduct monitoring program to establish long-term trends of abundance and distribution of populations

### **Management Plan**

Maxell, Bryce A. 2000. Management of Montana's amphibians: a review of factors that may present a risk to population viability and accounts on the identification, distribution, taxonomy, habitat use, natural history, and the status and conservation of individual species. Contract No. 43-0343-0-0224. September 20, 2000.

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## Western Toad (*Bufo boreas*)

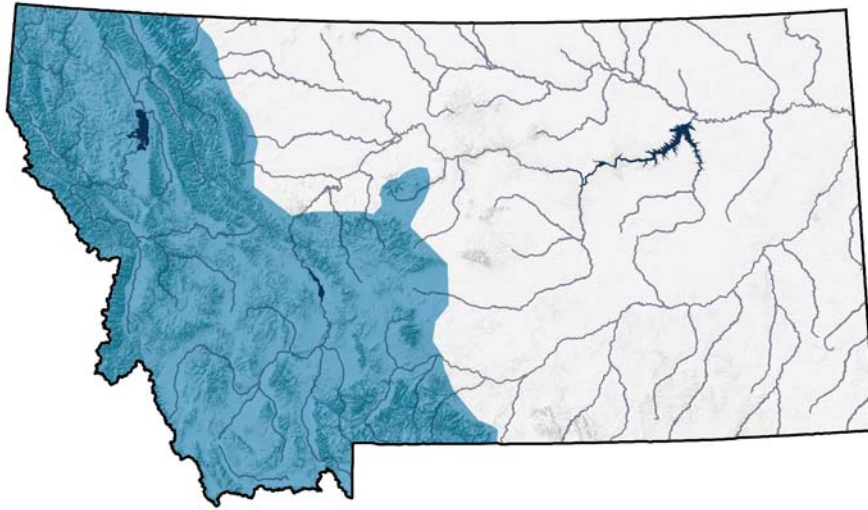


Figure 62. Distribution of the Western Toad

### Range

The western toad is found throughout the mountains and intermountain valleys of the western third of the state on both sides of the Continental Divide (Maxell et al. 2003). Specimens have been collected in 22 western counties and sighted in 5 more, at elevations up to 9,220 feet (2,810 meters).

### Habitat

Habitats used by western toads in Montana are similar to those reported for other regions and range from low-elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes to high-elevation ponds, fens, and tarns at or near tree line (Rodgers and Jellison 1942; Brunson and Demaree 1951; Miller 1978; Marnell 1997; Werner et al. 1998; Boundy 2001). Forest cover in or near encounter sites is often unreported, but toads have been noted in open-canopy ponderosa pine woodlands and closed-canopy dry conifer forests in Sanders County (Boundy 2001), willow wetland thickets and aspen stands bordering Engelmann spruce stands in Beaverhead County (Jean et al. 2002), and mixed ponderosa pine/cottonwood/willow sites or Douglas-fir/ponderosa pine forests in Ravalli and Missoula counties (P. Hendricks, personal observation).

Elsewhere the western toad is known to utilize a wide variety of habitats, including desert springs and streams, meadows and woodlands, mountain wetlands, beaver ponds, marshes, ditches, and backwater channels of rivers where they prefer shallow areas with mud bottoms (Nussbaum et al. 1983; Baxter and Stone 1985; Russell and Bauer 1993; Koch and Peterson 1995;

Hammerson 1999). Forest cover around occupied montane wetlands may include aspen, Douglas-fir, lodgepole pine, Engelmann spruce, and subalpine fir; in local situations western toads may also be found in ponderosa pine forest. They also occur in urban settings, sometimes congregating under streetlights at night to feed on insects (Hammerson 1999; P. Hendricks, personal observation). Normally they remain fairly close to ponds, lakes, reservoirs, and slow-moving rivers and streams during the day, but may range widely at night. Eggs and larvae develop in still, shallow areas of ponds, lakes, or reservoirs or in pools of slow-moving streams, often where there is sparse emergent vegetation. Adult and juvenile western toads dig burrows in loose soil, use burrows of small mammals, or occupy shallow shelters under logs or rocks. At least some toads overwinter in terrestrial burrows or cavities, apparently where conditions prevent freezing (Nussbaum et al. 1983; Koch and Peterson 1995; Hammerson 1999).

## Management

In previous decades the western toad was considered the most abundant amphibian of the western third of the state (Rodgers and Jellison 1942; Brunson 1952; Maxell 2003), and although still encountered widely and frequently though by no means commonly, it is no longer ranked as the most abundant amphibian. Numerous surveys since the early 1990s indicate that this species has experienced regional population declines in the state. Western toads were documented to breed at only 2 to 5 percent of more than 2,000 standing water bodies surveyed since 1997, and where breeding was documented, fewer than ten breeding females contributed in a given year (Maxell 2000; Maxell et al. 2003). Range-wide declines in this species have been indicated in Montana as well as in other western states.

## Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Breeding site destruction	Reduce access by livestock to known breeding sites within grazing allotments, which will prevent undue trampling mortality (Bartelt 1998)
	Protect certain wetlands occupied by western toads from introduced species and human disturbance
	Survey road ditches for tadpoles before any blading of ditches in June/July
	Survey wetlands suitable for western toads

Diseases such as red-leg disease and chytrid fungus	To prevent spread of chytrid fungus, personnel working in either lentic or lotic systems should thoroughly rinse and decontaminate all equipment as described in Maxell et al. (2004)
Use of chemicals and fertilizers	Avoid use of pesticides, fertilizers, and herbicides near known breeding areas
Increased predation by species attracted to human disturbance	Avoid stocking of predatory game fish at sites lacking them

## Management Plan

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## Northern Leopard Frog (*Rana pipiens*)

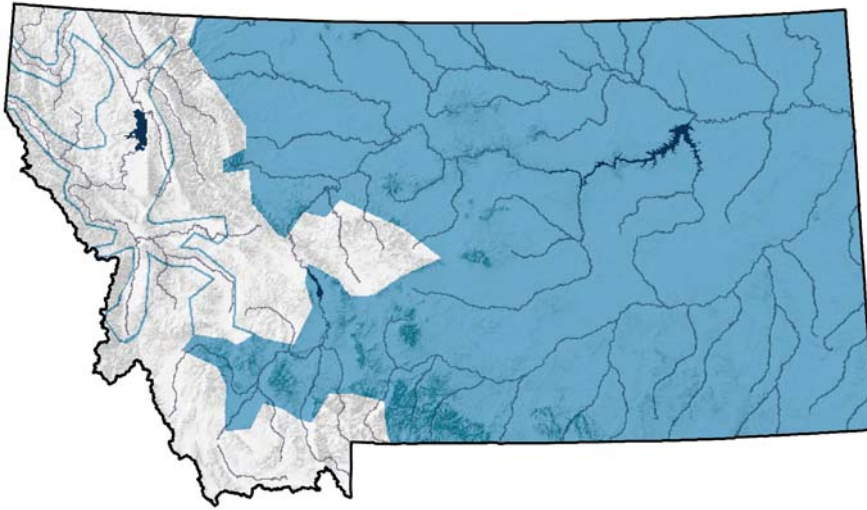


Figure 63. Distribution of the Northern Leopard Frog

### Range

The northern leopard frog is found across the prairie regions of the eastern two-thirds of Montana east of the Continental Divide (Maxell et al. 2004; Werner et al. 2004). It was historically dispersed throughout intermountain valleys west of the Continental Divide, especially in the Flathead and lower Clark Fork river drainages, but in recent years has been documented as isolated populations in only two western sites (Werner 2003; Johnson 2005): near Kalispell (Flathead County) and Eureka (Lincoln County). This frog has been documented in all but seven Montana counties (six of which are west of the Continental Divide), at elevations up to 6,700 feet (2,042 meters).

The northern leopard frog's historical distribution is irregular but includes western Montana except in the Big Hole area, as well as the tip of the Idaho Panhandle and southeast and parts of southwest Idaho (Stebbins 1985). Recent extirpations are reported in all of western Montana and across much of the neighboring states (Werner and Reichel 1994; Reichel and Flath 1995).

### Habitat

Habitats used by northern leopard frogs in Montana include low-elevation and valley bottom ponds, spillway ponds, beaver ponds, stock reservoirs, lakes, creeks, pools in intermittent streams, warmwater springs, potholes, and marshes (Brunson and Demaree 1951; Mosimann and Rabb 1952; Black 1969; Miller 1978; Dood 1980; Reichel 1995; Hendricks and Reichel 1996; Hendricks 1999). Northern leopard frogs require a mosaic of habitats to meet annual requirements of all life stages. They occupy a variety of wetland habitats of relatively fresh

water with moderate salinity, including springs, slow streams, marshes, bogs, ponds, canals, floodplains, beaver ponds, reservoirs, and lakes, usually in permanent water with rooted aquatic vegetation. Adults and juveniles commonly feed in open or semi-open wet meadows and fields with shorter vegetation, usually near the margins of water bodies where there is permanent water and growth of cattails or other aquatic vegetation, yet they may forage far from water in damp meadows (Stebbins 1985). They seek cover underwater and seem to avoid denser vegetation.

Northern leopard frogs have a large range throughout much of the United States and southern Canada (NatureServe 2004) and are still common in many areas and in a wide array of pristine and disturbed habitats (NatureServe 2004). NatureServe (2004) lists the northern leopard frog in 35 states in the United States and 12 Canadian provinces. In Montana the northern leopard frog is found primarily in riparian habitat but is not as restricted to water as other *Rana* species (Black 1969; Miller 1978). This species is abundant on plains near permanent water (Black 1969; Mosimann and Rabb 1952), tends to avoid tall, dense grass areas (Miller 1978), and prefers densely vegetated areas such as wet sedge meadows or cattail marshes (Reichel and Flath 1995; Werner and Reichel 1994).

## Management

No special management needs are currently recognized for populations in eastern Montana; however, in western Montana, monitoring and reintroduction programs are occurring. Any populations discovered in the western region should be reported to the native species biologist of the Montana Department of Fish, Wildlife & Parks or the program zoologist of the Montana Natural Heritage Program.

## Conservation Concerns & Strategies

Conservation Concerns	Conservation Strategies
Northern Leopard Frog range has nearly vanished on western side of Continental Divide in Montana	Protect the two remaining breeding populations west of the Continental Divide in Montana
	Survey western Montana to locate additional populations
	Monitor historical breeding sites and populations
Loss of wetlands and hydrological regimes	Habitat conservation and improvement projects
	Protect breeding sites from livestock impacts

Introduction of game fish, mosquitofish, and bullfrogs	Allow no introduction of game fish or bullfrogs into waters with known breeding sites
Contamination by pesticides and herbicides	Protect breeding sites from organic and chemical (pesticide and herbicide) contamination
Pathogens, including chytrid fungus ( <i>Batrachochytrium dendrobatidis</i> )	To prevent spread of chytrid fungus, personnel working in either lentic or lotic systems should thoroughly rinse and decontaminate all equipment as described in Maxell et al. 2004 (unpublished)
Global change (climatic and atmospheric changes such as increased UV-B radiation, pollution, acid rain, and disease)	Conduct monitoring program to establish long-term trends of abundance and distribution of populations
Unsustainable use and illegal collecting	Increase education and information on amphibian biology and awareness of the importance of breeding sites

## Management Plan

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